IN THE CLAIMS:

Please write the claims to read as follows:

Please cancel claims 2, 6, and 16 without prejudice.

1. (Currently Amended) A method comprising:

iteratively decoding a turbo product code (TPC) code word by:

i) generating a probability indicative parameter, using a soft decision algorithm, for each of a plurality of sequences of bits from the TPC code word;

ii) de-interleaving the TPC code word to generate a de-interleaved TPC code word;

iii) decoding the de-interleaved TPC code word, using a TPC decoder, as a function of the probability indicative parameter from the soft decision algorithm to generate a decoded TPC code word; and

iv) re-interleaving the decoded TPC code word for use by the soft decision algorithm in updating the probability indicative parameter for each of the plurality of sequences of bits; and

terminating the iterative decoding when the TPC code word satisfies a cyclic redundancy check (CRC).

2. (Cancelled)

3. (Currently Amended) The method of claim ~~2~~1, wherein the soft decision algorithm is a Bahl, Cocke, Jelinek, and Raviv (BCJR) algorithm.

4. (Currently Amended) The method of claim ~~2~~1, wherein the soft decision algorithm is a soft output viterbi algorithm (SOVA).

5. (Currently Amended) The method of claim 4~~1~~, wherein iteratively decoding the TPC code word further comprises iteratively decoding a TPC code word with single parity check (TPC/SPC).

6. (Cancelled)

7. (Currently Amended) The method of claim ~~6~~1, ~~and~~ further comprising:

performing the CRC on the decoded TPC code word.

8. (Currently Amended) The method of claim ~~7~~1, ~~and~~ further comprising:

terminating the iterative decoding prior to the TPC code word satisfying the CRC if a predetermined number of iterations between the ~~SOVA~~ soft decision algorithm and the TPC decoder have been completed.

9. (Currently Amended) The method of claim ~~8~~1, ~~and~~ further comprising:

performing an error correcting code (ECC) on the decoded TPC code word.

10. (Original) The method of claim 1, and before the step of iteratively decoding the TPC code word, further comprising appending CRC data bits to one of a plurality of code blocks of the TPC code word.

11. (Original) The method of claim 10, and after the step of appending the CRC data bits to one of the plurality of code blocks of the TPC code word, further comprising adding a row and a column of parity bits to each of the plurality of code blocks of the TPC code word.

12. (Currently Amended) A data storage system, comprising:~~configured to implement the method of claim 1~~

iterative decoder implementing circuitry having a soft decision algorithm and a turbo product code (TPC) decoder, the circuitry configured to iteratively decode a TPC code word by:

i) generation of a probability indicative parameter, using the soft decision algorithm, for each of a plurality of sequences of bits from the TPC code word;

ii) de-interleaving of the TPC code word to generate a de-interleaved TPC code word;

iii) decoding of the de-interleaved TPC code word, using the TPC decoder, as a function of the probability indicative parameter from the soft decision algorithm to generate a decoded TPC code word; and

iv) re-interleaving of the decoded TPC code word for use by the soft decision algorithm in updating the probability indicative parameter for each of the plurality of sequences of bits; and

wherein the iterative decoder implementing circuitry is further configured to terminate the iterative decoding when the TPC code word satisfies a cyclic redundancy check (CRC).

13. (Original) The data storage system of claim 12, wherein the TPC code word contains 512 bytes of user data.

14. (Currently Amended) A communication system, comprising: ~~configured to implement the method of claim 1~~

iterative decoder implementing circuitry having a soft decision algorithm and a turbo product code (TPC) decoder, the circuitry configured to iteratively decode a TPC code word by:

i) generation of a probability indicative parameter, using the soft decision algorithm, for each of a plurality of sequences of bits from the TPC code word;

ii) de-interleaving of the TPC code word to generate a de-interleaved TPC code word;

iii) decoding of the de-interleaved TPC code word, using the TPC decoder, as a function of the probability indicative parameter from the soft decision algorithm to generate a decoded TPC code word; and

iv) re-interleaving of the decoded TPC code word for use by the soft decision algorithm in updating the probability indicative parameter for each of the plurality of sequences of bits; and

wherein the iterative decoder implementing circuitry is further configured to terminate the iterative decoding when the TPC code word satisfies a cyclic redundancy check (CRC).

15. (Currently Amended) An apparatus comprising:

an iterative decoder having a soft decision algorithm implementing circuitry and a turbo product code (TPC) decoder, the circuitry configured to iteratively decode a ~~turbo product code (~~TPC~~)~~ code word by:

i) generation of a probability indicative parameter, using the soft decision algorithm, for each of a plurality of sequences of bits from the TPC code word;

ii) de-interleaving of the TPC code word to generate a de-interleaved TPC code word;

iii) decoding of the de-interleaved TPC code word, using the TPC decoder, as a function of the probability indicative parameter from the soft decision algorithm to generate a decoded TPC code word; and

iv) re-interleaving of the decoded TPC code word for use by the soft decision algorithm in updating the probability indicative parameter for each of the plurality of sequences of bits;

cyclic redundancy check (CRC) implementing circuitry configured to perform a CRC on the TPC code word; and

wherein the iterative decoder is configured to terminate the iterative decoding when the TPC code word satisfies the CRC.

16. (Cancelled)

17. (Currently Amended) The apparatus of claim 15, wherein the soft decision algorithm implementing circuitry is configured to implement a soft output viterbi algorithm (SOVA).

18. (Currently Amended) The apparatus of claim ~~16~~15, wherein the TPC code word is a TPC code word with single parity check (TPC/SPC), and wherein the iterative decoder is configured to iteratively decode a TPC/SPC code word.

19. (Currently Amended) A method comprising:

providing a plurality of square code blocks of a turbo product code (TPC) code word of user data, the user data having a predefined user data length; and

appending cyclic redundancy check (CRC) data bits to at least one of the plurality of code blocks, the appended CRC data bits extending a length of the code word beyond the user data length to an extended length.

20. (Original) The method of claim 19, and further comprising:

iteratively decoding the TPC code word; and

terminating the iterative decoding when the TPC code word satisfies a cyclic redundancy check (CRC).

Please insert the following new claims 21 *et seq.*:

21. (New) The method of claim 19, wherein the user data length is 4096 bits and the extended length of the code word is greater than 4096 bits.

22. (New) The method of claim 19, further comprising:

iteratively decoding the TPC code word between a soft decision algorithm and a TPC decoder.

23. (New) The method of claim 19, wherein the TPC code word is interleaved for the soft decision algorithm and de-interleaved for the TPC decoder.